

Editorial

We Have Newton on a Retainer: Reductionism When We Need Systems Thinking

Sidney W.A. Dekker, Ph.D.

Something must have gone terribly wrong when a 16-year-old patient died after a nurse accidentally administered a bag of epidural analgesia by the intravenous route instead of the intended penicillin. What was it? We typically want to find the broken parts, fix them, remove them, and make sure that they can't contribute to failure again. The root cause analysis (RCA) described by Smetzer et al. in this issue of the *Journal*¹ does precisely that. As a *starting point*, the RCA identified four proximate causes of the error: (1) availability of an epidural medication in the patient's room before it was prescribed or needed, (2) selection of the wrong medication from a table, (3) failure to place an identification band on the patient, which was required to utilize a point-of-care bar-coding system, and (4) failure to employ available bar-coding technology to verify the drug before administration. Then, the analysis explored why each of these proximate causes happened, working its way from the sharp end of the error to the underlying system problems that contributed to the error, which included a nonexistent system for communicating the pain management plan of care for the laboring patient to the nurse responsible for getting the patient ready for an epidural; variable expectations from anesthesia staff regarding patient readiness for an epidural; staff scheduling policies that did not guard against excessive fatigue; interconnectivity of tubing used for epidural and intravenous (IV) solutions; and system, process, and equipment problems that led to a 50% unitwide compliance rate with scanning medications using available bar-coding technology. The recommendations stemming from the RCA included designing a system to communicate the anesthesia plan of care, defining patient readiness for an epidural, establishing dedicated anesthesia staff for obstetrics, differentiating between epidural and IV medications, designing a quiet zone for preparing medications, establishing maximum work-hour policies for staffing schedules, and remedying issues with scanning problematic containers to improve bar code-scanning compliance rates.

See also pages 152–163.

It seems as if human error is still seen as a meaningful target for intervention by itself. Failure in health care, says Gawande,² is a result of human ineptitude. This notion is informed by a kind of Newtonian, reductionist thinking in which we hunt for the “broken part” that needs fixing or replacement. Yet “errors” come from somewhere, occurring in spite of people's continuous efforts to accommodate the enormous complexity that typifies health care today. People have to reconcile a multitude of goal conflicts, production pressures, discontinuities across specialties and departments, resource constraints, new technologies, and patient expectations. When things go well, health care tends to celebrate “good doctoring”³—acts by competent people who succeeded despite the organization and its complexity. When things do not go well—when adverse events occur—health care tends to zero in on the people at the sharp end who, for once, failed to hold that complex, pressurized patchwork together—rather than inquire about the systemic sources behind the production of all that complexity.

Nowhere do I encounter these simultaneous beliefs in individual strength and brittleness as persistently as in health care: Safety lies in the hands through which care ultimately flows to the patient. Thus, we can ask caregivers to try harder, to stare at labels more aggressively, and to double-check more often, with more technology. To instead invoke “systems problems,” it might be thought, is to engage in a “dry language of structures, not people.”³ (p. 73) Pellegrino contends that rather than “systems,” health care needs individuals with “strength of character to be virtuous.”⁴(p. 95) According to this line of thinking, promoting “systems problems” undermines the unique fiduciary relationship between caregiver and patient and shortcuts personal control over, and accountability for, clinical outcomes. Of course, there is no substitute for medical experience, expertise, and competence, and the deference and ethical responsibilities that come with it. Yet there seems to be something path-dependent here: a historical residue of the uniquely gifted shaman, witch doctor, healer, medicine man—who is able to interlocate between mortals and the metaphysical, ruling over life and death. Real medicine men perform dancing art. They

don't use a checklist to map out the steps.

Indeed, health care seems to be obsessed with the autonomy of its individual actors—which produces fascinating cognitive dissonances. For example, 20% of staff surveyed by Gawande about a surgical checklist (which, in another study, nearly halved surgical deaths⁵) said that it wasn't easy to use and that it didn't improve safety.² Yet 93% wanted to have the checklist used when *they* were undergoing an operation. Medicine's deontological principle means that nothing is more sacred than your obligation to the patient in your care. Except when you are the patient yourself. Then suddenly that surgical checklist sounds like a good idea. Then the ethical obligation and fiduciary relationship that form the bedrock of medicine's unique subculture can apparently no longer be trusted to provide safe care.

That aside, it is not that other fields don't have a deontological commitment. They do. When I fly, I and the rest of the crew have 150 or so lives in our hands. Nothing is more important than those lives and the fact that they are entrusted to us. With some decisions—for example, whether to hold and wait for better weather or to divert to an alternate airport—the airline and its economics must take a back seat to safety. Of course, this may have something to do with the subtle fact that we sit up front and are the first to arrive at the scene of an accident. However, I doubt that this reality changes the deontological dynamic much. Responsible practitioners are responsible practitioners: The consequences of failure are devastating, no matter what. The nurse involved in the error that is discussed in the Smetzer et al. article is a case in point.

The concept of health care as a complex system seems to be widely recognized. Yet there is still a lingering tendency to reach for simple solutions, for silver bullets, for single-factor explanations, and to bemoan the "ineptitude" of those defeated by the system's complexity and to celebrate the "strength of character" of those able to "work around" it.

If the system really *is* complex, let's start to act as if we really understand what that means. Complexity theory, rather than Newtonian reductionism, is where health care should look for answers. With the introduction of each new part or layer of defense, technology, procedure, or specialization, there is an explosion of new relationships *between* parts, layers, and components that spreads out through the system. Complexity theory explains how accidents emerge from these relationships, even from perfectly "normal" relationships, where nothing (not even a part) is seen as broken.⁶ The drive to make systems reliable, then, also makes them very complex—which, paradoxically, can in turn make them less safe. Redundancy—putting in extra barriers—or fixing them does not provide any protection

against a system safety threat. In fact, it helps perpetuate or even heighten the threat. For example, introducing a layer of technology (point-of-care bar-coding system) for double-checking a medication order against a patient identification may require novel interface management skills that can get in the way of doing the primary task: taking care of the patient.⁶ So quality is not safety. Quality is about parts; safety is about systems. A part by itself cannot even be safe or unsafe. Safety or its absence is an emergent property of the relationships between parts.⁷

There is something seductive about "going down and in" to find the "broken part" and fix it—for example, telling professionals to be "more professional." No wonder that Newton has been on a retainer for more than three centuries. However, complexity theory says that if we really want to understand failure in complex systems, we need to "go up and out" to explore how things are related to each other and how they are connected to, configured in, and constrained by larger systems of pressures, constraints, and expectations. As addressed by the RCA, we also would ask why the nurse involved in the error is at work *again* this day after hardly a break, filling in an empty slot (see the recommendation in Table 5 of Smetzer et al. to "reduce the risk of staff fatigue"¹). However, taking it a step further, we would also identify managerial, administrative, political, and budgetary motivations, which would be linked to insurance mercantilism, the commercialization of disease, and the demand for a commodification of health care's prices and products. We would want to find how, since Florence Nightingale, nursing has steadily lost status, reward, and attraction, with ranks that are hard to fill; how its traditional provision of succor has eroded under the relentless industrialization of care; and how its role as patient advocate has become hollow, because there is always the *next* patient. And the next. And, if we have the societal courage, we might inquire after the conditions and collective norms that make it plausible for a 16-year-old girl in the community to be pregnant and in need of hospital care. If we do not dare undertake this line of inquiry, then it is no surprise that all of the cumulative consequences suddenly emerge one day on the work floor of a busy, understaffed ward at a 440-bed community teaching hospital, with a patient screaming in acute, severe pain, demanding that something be done now, *now*. If we tinker only gingerly with the final, marginal technical minutiae at the sharp end, all of those systemic influences will collect again and again to shape what any other caregiver will see as the most rational course of action—no matter how large the label on a drug bag or how progressive the discipline. **I**

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In the course of his professional duties, the author has gotten to know the nurse involved in the case described in the article.

References

1. Smetzer J., et al.: Shaping systems for better behavioral choices: Lessons learned from a fatal medication error. *Jt Comm J Qual Patient Saf* 36:152–163, Apr. 2010.

2. Gawande A.: *The Checklist Manifesto: How to Get Things Right*. New York City: Henry Holt & Company, 2009.
3. Gawande A.: *Complications: A Surgeon's Notes on an Imperfect Science*. New York City: Picador, 2002.
4. Pellegrino E.D.: Prevention of medical error: Where professional and organizational ethics meet. In Sharpe V.A. (ed.): *Accountability: Patient Safety and Policy Reform*. Washington, DC: Georgetown University Press, 2004, pp. 83–98.
5. Haynes A.B., et al.: A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med* 360:491–499, Jan. 29, 2009. Epub Jan. 14, 2009.
6. Cook R.I., Woods D.D.: Adapting to new technology in the operating room. *Hum Factors* 38:593–613, Dec. 1996.
7. Leveson N.G.: *System Safety Engineering: Back to the Future*. Cambridge, MA: Aeronautics and Astronautics, Massachusetts Institute of Technology, 2006.

The Missing Safe Practice

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The leadership of St. Mary's Hospital deserves praise for finally beginning to tell its story about the fatal medication error that occurred in 2006.¹ That said, it is disappointing that a key safe practice is missing.

In 2007, I used this very case to propose five rights of caregivers that health care leaders “must consider as an integral part of a fair and just culture when patients are harmed during the process of care.”^{2(p. 107)} Careful study of the associated issues led to an evidenced-based “Care of the Caregiver” safe practice, released early in 2009 by the National Quality Forum (NQF) in its *Safe Practices for Better Healthcare*.³ Developed through a transparent, consensus-based, national process set forth by the U.S. Congress in 2008, this safe practice, among a current total of 34 safe practices, became an endorsed national standard. Yet there is no evidence that Safe Practice 8 has ever been adopted at St. Mary's; it is not cited in the article.

The critical elements of Safe Practice 8 may be remembered by the acronym TRUST (Treatment that is just, Respect, Understanding and compassion, Supportive Care, and Transparency and the opportunity to contribute to learning).

Although trust was a major feature of the hospital's commentary,¹ absent was recognition of the sacred trust that caregivers put in their leaders. A recap of the elements of this national practice³ provides a lens through which to view the St. Mary's article:

Treatment that is Just: *A well-organized, evidence-based process should be followed to assess the behavior of individuals directly involved in an adverse event to identify issues of substance abuse, intentional harm, illness, reckless violations of clear policies and procedures, and/or gross negligence, in order to avoid inappro-*

priate blame.

No such process was apparent, only an immediate termination of the nurse involved in the case, Julie Thao. Absent in the article was the fact that the nursing unit did not use float or pool nurses, so that existing staff were expected to cover extra shifts when needed. Nursing staff reported that an annual incentive was given to the nurse who took the most extra shifts over full time. The establishment of a systematic process defined in the NQF practice, now going forward, is missing from the article.

Respect: *A formalized process should be followed by designated administrative senior leaders immediately after an incident to ensure that the individuals who are directly or indirectly involved are treated with respect and dignity.*

No such process is described in the article (see “Understanding and Compassion”).

Understanding and Compassion: *A formalized process should be followed by a designated administrative leader to invite co-workers to express personal understanding and compassion to those directly and indirectly involved in such events.*

When Julie, still an employee, went to the hospital pastoral care service, her co-workers were invited to come and console her. Instead, she and her co-workers reported that their nursing supervisor came to the department and ordered her physically off the property, forcing her nursing colleagues to console her, sobbing and exposed, outside on a sidewalk. Was this respect and compassion—or cruelty?

Supportive Care: *Caregivers, staff, and administrators, directly involved in serious unintentional harm . . . must be considered as patients requiring immediate and ongoing care.*

To St. Mary's credit, Julie was admitted to the hospital for treatment as a psychiatric emergency when she collapsed at the dead patient's bedside. Yet a few days later, according to Julie and her family, the hospital took her written statement when she was heavily medicated and without counsel, without providing her any copy of the statement. This statement ended up with the State nursing board and attorney general by an unclear process, ultimately leading to her criminal indictment. A single parent with four sons, now with no income and no financial resources to defend her in a trial, she accepted a plea-bargain conviction. Julie did not undergo fitness-for-work evaluation nor did she receive support from the organization as defined in the NQF safe practice. She lost her health care benefits from the hospital. It is unclear from the article whether St. Mary's would treat another caregiver any differently today.

Transparency: *Those individuals who are directly or indirectly involved in events should be invited to fully participate in the investigation and analysis of the incident unless, through the process [as defined], they were found to have been engaged in substance abuse or gross negligence, or their behavior was found to have intentionally induced harm.*

Only when St. Mary's engaged the Institute for Safe Medication Practices to conduct the root cause analysis did Julie play any role in the detailed investigation. What will happen with the next case?

This case of caregiver blame continues to send ripples through the health care community, contributing to a growing swell of fear when other cases of criminalization occur.⁴

Only when St. Mary's leaders and Julie unite in a spirit of healing and bring this case to the national stage as a learning moment will the full power of behavior shaping and lessons learned save other lives and careers. That is what we are waiting for—we challenge them to do so. Julie is ready. Is St. Mary's? ■

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References

1. Smetzer J., et al.: Shaping systems for better behavioral choices: Lessons learned from a fatal medication error. *Jt Comm J Qual Patient Saf* 36:152–163, Apr. 2010.
2. Denham C.R.: TRUST: The Five Rights of the Second Victim. *J Patient Saf* 3:107–119, Jun. 2007.
3. National Quality Forum: *Safe Practices for Better Healthcare—2009 Update: A Consensus Report*. Washington, DC: The National Quality Forum, 2009.
4. Institute for Safe Medication Practice: Eric Cropp weighs in on the error that sent him to prison. *ISMP Medication Safety Alert! Acute Care* 14:1–3, Dec. 3, 2009. <http://www.ismp.org/newsletters/acutecare/articles/20091203.asp> (last accessed Feb. 22, 2010).

Who's to Blame?

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There is a second tragedy at St. Mary's Hospital that is scarcely hinted at in the otherwise excellent report by Smetzer et al. of the investigation and response to a terrible fatal medication error.¹ That tragedy is what happened to the nurse who made the error, Julie Thao, whom the hospital blamed for the mishap and fired. Not only was this action calamitous for Julie, but if the hospital had taken institutional responsibility at the outset, the criminal indictment and loss of licensure might not have occurred. Julie was truly a second victim in more ways than one.

But blaming is a normal response, and in this kind of situation entirely predictable. Someone must be at fault when something this gross and this tragic occurs. “Fess up and take your punishment,” we cry. But if we substitute the less inflammatory word *accountability* for blame, the appropriate answer becomes more obvious. Accountability rests with the hospital.

And if you believe in punishment, the hospital deserves your punishment.

Why? Because, as the mantra since the Institute of Medicine report *To Err Is Human*² insistently reminds us: Errors and mishaps are caused by bad systems, not by bad people. Who is responsible for the systems? The hospital. Individual frontline caregivers—doctors and nurses—do not create or change systems, the organization does.

The root cause analysis conducted by the Institute for Safe Medication Practices (ISMP) identified systems failures in abundance at St. Mary's, and we commend the hospital leadership on its willingness to undergo investigation and to submit the report on the analysis for peer-reviewed publication so that all can learn from its experience.

However, one may ask, particularly in this case, what about personal competency, individual failings—and the person who

habitually commits “unsafe acts”? The *person* aspect of safety. “That’s not a systems problem” is the frequent refrain.

Ah, but yes it is. What oversight systems does a hospital have to ensure that all personnel perform competently and safely? How does leadership ensure that everyone has adequate training, maintains competency, and performs to standard? How is performance monitored? By whom? How frequently?

What is the system for dealing with performance problems when they are uncovered? Are failures dealt with promptly so they are not repeated? Are there remedial programs for individuals who have shortcomings? And, if remediation isn’t successful, what happens? If a nurse persistently exhibits unsafe conduct, does leadership know about it and deal with it appropriately? Performance problems, yes indeed. But, systems issues, too, and like all such issues, under the purview of the hospital leadership.

Yet nowhere in this extensive investigation, analysis, and commentary are any of these critical questions addressed. The report is eerily silent about all of them.

More to the point, there is no evidence that Julie Thao had a performance problem. No evidence has been produced, from any source, of previous performance failures, serious medication errors, or reckless conduct. Nor evidence of prior discipline. In fact, by newspaper accounts, she had worked at St.

Mary’s for 13 years, had “positive performance reviews,” and was considered an exemplary nurse. Yet she was fired. If it was for incompetence, where is the evidence? And if it was there, why wasn’t she dealt with before this tragic accident occurred?

The answer, of course, is that she was not incompetent. She was scapegoated. To appease the family and the public. To deflect attention from the hospital’s failures. And it worked. And it is deplorable.

The second tragedy of St. Mary’s was the destruction of a career and the infliction of incalculable damage to the person who was the second victim. That was the greatest system failure. St. Mary’s should acknowledge it, apologize, and offer restitution. ■

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References

1. Smetzer J., et al.: Shaping systems for better behavioral choices: Lessons learned from a fatal medication error. *Jt Comm J Qual Patient Saf* 36:152–163, Apr. 2010.
2. Institute of Medicine: *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press, 2000.



The Joint Commission Infection Prevention and Control Handbook for Hospitals

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